IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re U.S. Patent Application of John L. Russell, Jr. et al.
Application No. 10/568,728
Filed: February 17, 2006
For: Plastic Brachytherapy Sources
Atty. Docket No. IBT1.073-US
Group Art Unit: 3735
Examiner: Samuel G. Gilbert

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

DECLARATION OF AXEL HENTRICH, Ph.D. UNDER 37 C.F.R. § 1.132

Axel Hentrich, Ph.D. declares as follows:

Declarant

I am Development Engineer of IBt s.a. ("IBt") and make this statement in support of the patentability of U.S. Patent Application 10/568,728.

I understand that IBt is the assignee of record for this application. I have no financial interest in IBt other than as an employee.

Credentials

I, Dr. Axel Hentrich, am also a Development Engineer for Implants for Brachytherapy at Eckert & Ziegler BEBIG (an affiliate of IBt). I hold a Ph.D. in Biomedical Engineering / Polymer Science. I have been working in research development for medical devices for ten years and am a named inventor on seven patents for medical devices. My curriculum vitae submitted herewith contains additional details of my background.

Introduction

I understand that the present patent application is a U.S. National Stage entry of International Patent Application PCT/US2004/027116 filed August 20, 2004. Some claims of the present invention are directed toward a brachytherapy device, comprising an implantable radioactive source having a socket at each end, a functional unit with connecting ends, and a carrier. Other claims are directed

toward a method of preparing the implantable source. Such an implantable brachytherapy source typically comprises or is a radioactive seed.

I have been informed that the U.S. Patent Examiner asserts that U.S. Patent 6,264,599 to Slater et al ("Slater I") and U.S. Patent 6,273,851 to Slater et al ("Slater II") disclose radioactive therapeutic seeds including sockets as well as universal joints, spacers, and functional units which either anticipate or make obvious certain claims of the present patent application. I present evidence below to explain to the Examiner how the components of the present invention are distinguishable over those of Slater I and Slater II.

Discussion

Slater I and Slater II disclose brachytherapy seeds having ball joints at each end that can be attached to a connecting unit (spacer) having socket joints. The brachytherapy seeds of the present invention have the opposite configuration. Namely, the present seeds have socket joints and the functional units or spacers have ball-like endings. This arrangement as presently claimed is particularly distinguished from Slater I and Slater II as will be described further.

It is an innovation to have a socket on both sides of the seed of a plastic brachytherapy source. This shape, or configuration of the sockets at the ends of the seed, allows for both a connection to a functional unit and, at terminal connections, an exposed socket. The exposed socket reduces the seed migration in soft tissue when implanted as a single seed or as a strand or array of interconnected seeds. The hollow part of the socket acts, in effect, as an anchor when placed in soft tissue and prevents migration of the seed in the tissue.

For example, implanted seeds have sometimes been found to migrate from the prostate into the peripheral tissue or even into the urethra or seminal vesicles where it may eventually be eliminated from the body via discharge of urine or ejaculate. Unanchored seeds may also enter the lymphatic system. It is possible for an unanchored conventional seed to travel through the vein plexus of the prostate capsular and through the vein system up to the right ventricle whereupon it enters the circulation system. If the patient has anatomical irregularities, e.g. open foramen ovale, such a seed may even migrate to the left ventricle and it can enter the large circulation system.

Both Saibishkumar, E. P., Borg, J., et al., Sequential Comparison of Seed Loss and Prostate Dosimetry of Stranded Seeds with Loose Seeds in I-125 Permanent Implant for Low-Risk Prostate Cancer, Int. J. Radiation Oncology Biol. Phys. published online (2008), pp 1-8; and Tapen, E.M., Blasko J.C., et al., Reduction of radioactive seed embolization to the lung following prostate brachytherapy, Int. J. Radiation Oncology Biol. Phys., Vol. 42 No.5. (1998) pp. 1063-

1067 provide examples of seed migration in the bodies of patients treated with unanchored brachytherapy seeds. Seed migration was observed even when the seeds were part of a strand.

Based on my reading of the Slater I and Slater II patents, I conclude that the brachytherapy sources disclosed therein would be similarly subject to the likelihood of seed migrations because the shape of such seed is very close to the shape of conventional seeds that have been found to migrate.

The socket geometry of the seeds of this invention significantly increases the likelihood that the patient's tissue will grow into the exposed socket cavity, holding the seed in place to minimize the likelihood of migration of the seed from its initial implantation location. The advantage of a seed with sockets at each end is that a patient's tissue filling in the socket acts as an anchor to prevent migration. The use of seeds with anchored sockets reduces the likelihood of needing a second implantation treatment with additional seeds to correct the radiation dose distribution in a situation where seeds have migrated away from their intended targeted region (e.g. the prostate).

It is my opinion with reasonable scientific certainty that the socket geometry of a brachytherapy seed as disclosed in the present patent application is an effective physical feature for preventing migration of the seed after it is implanted into body tissue. I reach this conclusion based upon my knowledge of the types of seed migration of which I am aware.

Another innovative advantage of having the sockets as part of the seed capsule is to reduce the material mass of a non-biodegradable seed, replacing it by the biodegradable ball part of the functional unit. This reduces amount of foreign substance which remains in the patient's body long-term.

Verification

I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the above-referenced application or any patent issuing thereon.

November 4, 2010

Axel Hentrich, Ph.D.

CURRICULUM VITAE

DR. AXEL HENTRICH

PH.D. IN
MECHANICAL ENGINEERING /
BIOMEDICAL ENGINEERING

Work Experience

Since 10/2008	**Project Leader and Development Engineer at IBt Bebig LLC, Berlin** Responsible for developments of medical instruments and implants for brachytherapy treatments Planning and performing of several tests Patent researches and evaluations
05/2007 – 09/2008	**Project Engineer at the division X-Ray Tube Maintenance, Philips Medical Systems DMC LLC, Hamburg** Participation at the development of X-Ray Tubes Project management in the field of X-Ray tube maintenance Planning and performing of tests of X-Ray emitters Participation at an advanced training in Statistical Engineering, a method to solve quality problems in manufacturing processes
04/2005 - 04/2007	**Development Engineer at the R&D Department of the Division of Women's Health and Urology, ETHICON LLC, Norderstedt (fixed term contract)** Development of medical instruments and implants for gynaecology and urology Further development of diagnostic measurement systems Evaluation and further development of customer ideas Observation and analysis of gynaecological and urological operations for generation of product ideas in close cooperation with medical specialists Planning and performing of several tests Patent research and evaluation
03/2004 - 03/2005	**Industrial internship at B¦ Braun Melsungen AG, Vascular Systems, Berlin / Germany** Support of the R&D Division with the development and implementation of coronary stents and catheters Responsible for the construction of devices for medical applications
08/2000 - 03/2005	**Technical University of Berlin / Germany** **Institute Polymer Engineering / Dept. Material Science** 02/2005 Ph.D. in Biomedical Engineering / Polymer Science Thesis: "Manufacturing of Drug Eluting Polymer Stents by Dip Coating from Polymer Solutions" Project management of different projects in cooperation with different companies and clinics Teaching responsibilities and academic support of students
03/2000 - 07/2000	**Design engineer at "aap Implantate AG Berlin", Berlin / Germany** R&D of instruments for the application of hip implants

EDUCATION AND MISCELLANEOUS

10/1991 - 10/1999	Technical University of Berlin / Germany B.Sc.(Cand.-Ing) in Mechanical Engineering M.Sc. (Dipl.-Ing.) in Mechanical Engineering / Biomedical Engineering M.Sc. thesis: "Development of a Perfusion System for Human Placentas", Final technical project support ("placenta perfusion") for the working group of Perinatal Medicine of Charité Berlin/Germany up to 02/2000
03/1996 - 06/1998	Research Assistant at the Biofluid Mechanics Laboratory of the Charité Berlin / Germany Student research project: "Investigation of the Flow Conditions in a Left Heart Ventricle Assist Device"
09/1987 - 07/1990	College Entrance Diploma (Abitur) in Königs Wusterhausen / Germany Professional trade training in Wildau / Germany Journeyman's certificate as a Machine Technician
09/1990 - 08/1991	Military service

EXPERIENCE ABROAD

07/1999 - 09/1999	Department of Biomedical Engineering, Seoul National University, Seoul / South Korea Research Scientist: R&D support for the Korean Artificial Heart Program
08/2002 - 09/2002	English language course in Brighton / UK

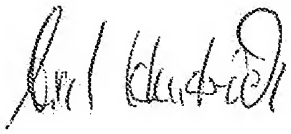
LANGUAGE SKILLS

German (native speaker)
English (good working knowledge)
Russian (moderate)

COMPUTER SKILLS

MS-Office applications

CAD: 3D (Unigraphics NX4, Solid Edge, CATHIA V5),
2D AutoCAD



Berlin, October 19, 2010